

a camera unit; and

ant.
03/6
a pan head comprising a movable portion and a fixed portion, and capable of being pan-driven, wherein said movable portion and said fixed portion have engagement means engaged with each other for pan rotation, said engagement means includes a plurality of engaged portions on the circumference about a center of pan rotation, and said plurality of engaged portions are formed of a resin material high in lubricity.

REMARKS

The claims now pending in the application are Claims 1 to 17, the independent claims being Claims 1, 6, 11 and 17. Claims 18 and 19 have been cancelled. Claims 1 to 1, 4-6, 9-11 and 14-17 have been amended.

In the Official Action dated February 7, 2002, the specification and drawings were objected to on formal grounds. Claims 1 to 3, 5 to 8 and 10 were rejected under 35 U.S.C. § 103(a), as unpatentable over U.S. Patent No. 6,011,925 (Hosoe), in view of U.S. Patent No. 4,945,367 (Blackshear), and Claims 4, 9 and 11 to 16 were rejected under 35 U.S.C. § 103(a), as unpatentable over the Hosoe '925 patent and the Blackshear '367 patent, further in view of U.S. Patent No. 6,203,216 (Koizumi). Claim 17 was rejected under 35 U.S.C. § 102(b), as anticipated by U.S. Patent No. 4,341,452 (Korling). Claims 18 and 19 were rejected under 35 U.S.C. § 102(b), as anticipated by U.S. Patent No. 5,790,910 (Haskin). Reconsideration and withdrawal of the objections and rejections respectfully are requested in view of the above amendments and the following remarks.

Initially, in formal matters, the specification has been amended as to matters of form, including English spelling, grammar, idiom, syntax and the like, with particular attention to the Examiner's comments. No new matter has been added.

By separate paper filed concurrently herewith, Applicants have submitted a Request for Approval to Amend the Drawings. In that Request, Applicants have proposed formal amendments to Figs. 1-5, 7 and 10, as requested by the Examiner. No new matter has been added.

The rejections of the claims over the cited art respectfully are traversed. Nevertheless, without conceding the propriety of the rejections, Claims 1, 4 to 6, 9 to 11, and 14 to 17 have been amended herein more clearly to recite various novel features of the present invention, with particular attention to the Examiner's comments. Support for the proposed amendments may be found in the original application. No new matter has been added.

Applicant submits that the prior art fails to anticipate the present invention. Moreover, Applicant submits that there are differences between the subject matter sought to be patented and the prior art, such that the subject matter taken as a whole would not have been obvious at the time the invention was made to one of ordinary skill in the art.

The Hosoe '925 patent relates to an image input apparatus having a pan head, and discloses an apparatus including a camera unit and a pan head having a control mechanism for at least two axes. However, Applicant submits that the Hosoe '925 patent fails to disclose or suggest at least the above-discussed features of the present invention. In particular, Applicant submits that the Hosoe '925 patent fails to disclose or suggest at least the feature of a connecting member that is a flexible flat cable, where at least a part of the

flexible flat cable is disposed in an arcuate shape about the center line of tilt rotation, as disclosed and claimed in the present application.

The Blackshear '367 patent relates to a surveillance camera system, and discloses a system including a video camera, and a camera mount for panning movements about a vertical pan axis and tilting movement about a horizontal tilt axis. However, Applicant submits that the Blackshear '367 patent fails to disclose or suggest at least the above-discussed features of the present invention. Although the Blackshear '367 patent discloses that the center of gravity of a camera unit is located at the center of tilt rotation, the Blackshear '3667 patent fails to disclose or suggest a system including first and second circuit boards and a connector member that is a flexible flat cable, at least a part of which is disposed in an arcuate shape about the center line of tilt rotation, as disclosed and claimed in the present application. Nor is the Blackshear '367 patent believed to add anything to the Hosoe '925 patent that would make obvious the claimed invention.

The Koizumi '216 patent relates to a panning apparatus including an arrangement of cables in a voluted shape, and discloses an arrangement of cables 5,6 disposed in a voluted shape around a pan rotation shaft and a bush guide for guiding the cable. However, Applicant submits that the Koizumi '216 patent fails to disclose or suggest at least the above-discussed features of the present invention. Nowhere is the Koizumi '216 patent understood to disclose or suggest the feature of a flexible flat cable, at least a part of which is disposed in an arcuate shape about the center line of tilt rotation, as disclosed and claimed in the present application. Nor is the Koizumi '216 patent understood to add anything to the Hosoe '925 patent and the Blackshear '367 patent that would make obvious the claimed invention.

The Korling '452 patent relates to a triaxial universal camera mount, and discloses a mount assembly including a camera independently pivotable about three axis, including a shaft slidably pan rotating, with plastic wire. However, Applicant submits that the Korling '452 patent fails to disclose or suggest at least the above-recited features of the present invention (amended Claim 17). Nowhere is the Korling '452 patent understood to disclose or suggest the features of engagement means including a plurality of engaging portions on the circumference about a center of pan rotation, or where the plurality of engaged portions are formed of a resin material high in lubricity, as disclosed and claimed in the present application.

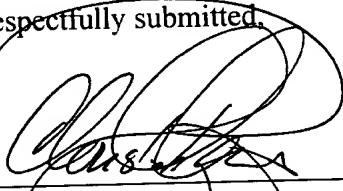
For the above reasons, Applicant submits that independent Claims 1, 6, 11 and 17 are allowable over the cited art.

Claims 2 to 5, 7 to 10 and 12 to 16 depend from Claims 1, 6 and 11, respectively, and are believed allowable for the same reasons. Moreover, each of these dependent claims recites additional features in combination with the features of its respective base claims, and is believed allowable in its own right. Individual consideration of the dependent claims respectfully is requested.

Applicant believes that the present Amendment is responsive to each of the points raised by the Examiner in the Official Action, and submits that the application is in allowable form. Favorable consideration of the claims and passage to issue of the present application at the Examiner's earliest convenience earnestly are solicited.

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,



Attorney for Applicant

Registration No. 22,078

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-3801
Facsimile: (212) 218-2200
CPW\gmc
DC_MAIN 102063v1

MARKED-UP AMENDED SPECIFICATION

Please substitute the paragraph starting at page 1, line 5 and ending at line 10, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--This invention relates to a movable camera apparatus, and particularly to a movable camera apparatus with a pan head in which a camera unit is driven in a pan (horizontal) direction and a tilt (vertical) direction[] so as to take a still picture or [and] a motion picture.--

Please substitute the paragraph starting at page 1, line 12 and ending at line 20, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--A movable camera apparatus of this kind according to the prior art [is such that as described], for example, is [in] Japanese Utility Model Application Laid Open No. 6-9264, in which a camera unit is supported for tilt (vertical) rotation by a vertical support erected from a horizontal supporting portion, and a main circuit board is erected on the horizontal supporting portion so as to be opposite in position to a vertical supporting portion relative to the camera unit.--

Please substitute the paragraph starting at page 1, line 21 and ending at page 2, line 1, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--Another [Also, a] movable camera apparatus of this kind according to the prior art [is such that as described], for example, is [in] Japanese Utility Model Publication No. 2-4319, in which two short vertical supporting portions are erected from a horizontal supporting portion and support a vertical (tilt) rotary shaft provided in the lowermost portion of a camera unit for vertical (tilt) rotation.--

Please substitute the paragraphs starting at page 2, line 2 and ending at line 6, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--Pan [Also, the] rotation [of a pan] is designed so as to be effected with only a journalled rotary shaft [pan rotary shaft journalled].

Also, a portion (a worm [warm] portion, a drive motor, etc.) of a tilt drive unit is disposed in the horizontal supporting portion.--

Please substitute the paragraph starting at page 2, line 7 and ending at line 16, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--Further, the vertical (tilt) rotary shaft is [formed] hollow, and a cable for transmitting a signal from the camera unit is inserted therethrough [thereinto] and is directed to the fixed portion of a pan head. The way of leading it about is a simple one in which the cable is merely passed through an internal gap, but an opening portion is barely [scarcely] provided in a case member including a peripheral portion about which the cable is led, particularly the vertical support portion and the horizontal supporting portion near the root thereof.--

Please substitute the paragraph starting at page 2, line 17 and ending at page 2, line 27, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--According to the examples of the prior art as described above, the horizontal supporting portion supports the camera unit for vertical (tilt) rotation by an erected vertical supporting portion and, therefore, the load of the camera unit is concentrated [concentrates] in the tilt rotary shaft and bearing portion of the single vertical supporting portion. Thus [and thus], the surroundings of the tilt rotary shaft and the bearing portion must be mechanically strong and, as a result, [necessarily] the supporting portion becomes bulky and the entire apparatus becomes massive.--

Please substitute the paragraph starting at page 3, line 1 and ending at line 10, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--Also, since the main circuit board is erected on the horizontal supporting portion so as to be opposite in position to the vertical supporting portion relative to the camera unit, the weight of the horizontal (pan) supporting portion which is a movable portion is increased. Therefore [and therefore], the acceleration or deceleration time becomes long and high-speed driving becomes impossible; alternatively, [or] for effecting high-speed driving, a horizontal (pan) drive unit becomes bulky and the apparatus becomes massive.--

Please substitute the paragraph starting at page 3, line 11 and ending at line 17, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--Further, the two vertical supporting portions [portion] erected from the horizontal supporting portion are short. Therefore [and therefore], the space for escape during [the] vertical (tilt) movement of the camera unit is small, and the range of vertical (tilt) movement has [had] to be limited narrowly so that a portion of the camera unit may not abut against the horizontal supporting portion.--

Please substitute the paragraph starting at page 3, line 25 and ending at page 4, line 6, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--Further, the vertical (tilt) rotary shaft provided in the lowermost portion of the camera unit is supported for vertical (tilt) rotation. Therefore, it will be apparent that [and therefore, apparently] the center of gravity of the camera unit is above the center of vertical (tilt) rotation. Therefore [and therefore], the moment of inertia of vertical (tilt) rotation increases, and in order to obtain a necessary driving force, the vertical (tilt) drive unit becomes bulky and the apparatus becomes massive.--

Please substitute the paragraph starting at page 4, line 7 and ending at line 13, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--Further, since an opening portion is barely [scarcely] provided in the case member including the peripheral portion about which the cable is led, particularly the vertical supporting portion and the horizontal supporting portion near the root thereof [and therefore], the working property when the cable from the camera unit is led about in the fixed portion is very bad.--

Please substitute the paragraph starting at page 4, line 27 and ending at page 5, line 4, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--It is a first object of the present invention to support the vicinity of the center of gravity of the camera unit from [the] opposite sides thereof, to thereby achieve [the] downsizing of the [an] apparatus as a [the] result of [the] optimization of the [a] driving force.--

Please substitute the paragraph starting at page 5, line 5 and ending at line 9, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--Further, it is a second object of the present invention [is] to design a [such that the] camera unit that does not abut against a horizontal supporting portion during [the] vertical driving of the camera unit, to thereby widen the range of tilt driving of the camera unit.--

Please substitute the paragraph starting at page 7, line 11 and ending at line 27, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--The movable camera apparatus according to the present embodiment, as shown in Fig. 9, is comprised of a pan/tilt drive system 201, a taking lens system 202, a main circuit board 203, a camera circuit board 204 and an image pickup element circuit board 205, and the transmission and reception of signals such as a video signal and a camera control signal in each unit is executed through a connecting member such as a cable. The pan/tilt driving by the pan/tilt drive system 201 is effected by the driving command of the main circuit board 203. Also, control such [control] as the focusing, zooming and adjusting of light quantity, such as stopping down of the light quantity for the taking lens and the image pickup operation by an image pickup element, such as a CCD, are executed by a taking lens control command from the main circuit board 203 through the camera circuit board 204 and the image pickup element circuit board 205.--

Please substitute the paragraph starting at page 8, line 1 and ending at line 12, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--Also, by the connection of the main circuit board 203 to an external device 206, a photographed image can be displayed on the external device 206 side, and the pan/tilt control of the camera unit, or control such [control] as the focusing, zooming and stopping down of the light quantity for the taking lens 202, can be executed from the external device 206. Specifically, connection terminals to the external device (controller) 206 such as a video output terminal and RS232C and a power source input terminal for the supply of a power source to the main body of the camera apparatus with a pan head are installed on the main circuit board 203.--

Please substitute the paragraph starting at page 8, line 13 and ending at page 9, line 13, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--Referring to Fig. 1, the camera unit 1 is comprised of an image pickup optical system comprising a zoom and focus optical system, an exposure adjusting device (not shown), a lens unit 2 (202) comprising a drive system for driving them, an image pickup element circuit board 3 (205) which is disposed rearwardly of the lens unit 2 and on which an image pickup element is installed, a camera circuit board 4 (204) disposed sideways of the lens unit 2 and connected to the image pickup element circuit board 3, an upper camera case 5 and a lower camera case 6 including the aforescribed constructions and formed by a resin mold, thin metal plates 7 and 8 formed so as to cover each construction inside the camera unit 1 and attached to the upper camera case 5 and the lower camera case 6, respectively, by heat caulking or the like, a threaded ring 9 (see Fig. 2 [3 which will be described later]) for mounting a filter or the like mounted forwardly of the lens unit 2 so as to be sandwiched by and between the upper camera case 5 and the lower camera case 6, tilt rotary shafts 10 and 11 mounted on the lower camera case 6, fitted in the aperture portions 12a-1-a and 12a-2-a, respectively, of the camera supporting portions 12a-1 and 12a-2 of a pan head 12 which will be described later, and making the camera unit 1 rotatable in a tilt direction, etc. The tilt rotary shafts 10 and 11 may desirably be formed of a material high in lubricity and low in friction.--

Please substitute the paragraph starting at page 9, line 18 and ending at line 27, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--The tilt rotary shafts 10 and 11 have their shaft portions 10a and 11a fitted in aperture portions 6a and 6b, respectively, provided in the sides of the lower camera case 6, and fastened and fixed by self-tap apertures 10b-1, 10b-2 [10b-3 (10b-3 being not shown)] and apertures 11b-1, 11-b2 [11b-3 (11b-3 being not shown)] formed in flange portions 10b and 11b, respectively, and restraining apertures 6c-1, 6c-2 [6d-1, 6d-3 (6d-3 being not shown)] and 6d-1 6d-2 [6d-1, 6d-3 (6d-3 being not shown)] formed in [the opposite sides of the lower camera case 6.--

Please substitute the paragraph starting at page 10, line 1 and ending at line 5, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--When the tilt rotary shafts 10 and 11 are mounted on the lower camera case 6, the end surfaces 10a-1 and 11a-1 [11a-2] of the shaft portions 10a and 11a are dimensionally set so as to somewhat protrude from the opposite sides of the lower camera case 6.--

Please substitute the paragraph starting at page 11, line 6 and ending at line 22, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--The image pickup element circuit board 3 and the camera circuit board 4 are fastened and fixed at predetermined positions by a shaft portion 2a having a self-tap aperture formed in the lens unit 2. Two measures are conceivable as the predetermined positions of the camera circuit board 4. One of them, as shown in Fig. 1, is a measure of installing the camera circuit board on the camera supporting portion side lateral of the lens unit 2. According to this measure, a space for the board need not be provided upwardly or

downwardly of the camera unit portion, and the size in the height direction can be made small. This [, and this] is advantageous for [the] downsizing in the height direction. Also, this position is close to the camera supporting position 12a-1. Therefore [and therefore], the connecting members 16 and 17 may be short, and this is also advantageous for the saving of natural resources.--

Please substitute the paragraph starting at page 11, line 23 and ending at page 12, line 10, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--The other is a measure of disposing the camera circuit board above or below the camera unit

1. According to this method, the space for the board 4 need not be provided widthwisely of the camera unit 1, and this is advantageous for [the] downsizing in the withdwise direction. The image pickup element circuit board 3 and the camera circuit board 4 are connected together by a connecting member such as a flexible printed board. Also, the end portion of one of the connecting members 16 and 17 extending toward the main circuit board 18 of the pan head 12, which will be described later, is connected from the camera circuit board 4 by a connector or the like, and the passes through the hollow portion 10c of the tilt rotary shaft 10.--

Please substitute the paragraph starting at page 12, line 20 and ending at line 26, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--The construction of the pan head 12 of the camera apparatus with a pan head according to the present embodiment will now be described. The pan head 12 is divided into a movable portion 12a and fixed

portion 12b. The movable portion 12a in turn is divided into camera supporting portions 12a-1, 12a-2 and a movable base portion [12a-3] (not shown).--

Please substitute the paragraph starting at page 12, line 27 and ending at page 13, line 11, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--Description will first be made of the construction and mounting of the camera supporting portions 12a-1, 12a-2 of the movable portion 12a. The camera supporting portion 12a-1 is erected from the movable base portion [12a-3]. The camera supporting portion 12a-1 is provided with an aperture portion 12a-1-a coaxially with the central axis of tilt rotation, and the shaft portion 10e of the tilt rotary shaft 10 is fitted thereto. Also, provision is made of guides 13a, 13b, 14a, 14b and 15 for regulating the volute diameters of the connecting members 16 and 17 [15 and 16] (Fig. 2) and guiding them to the main circuit board 18. --

Please substitute the paragraph starting at page 14, line 27 and ending at page 15, line 5, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--Also, during tilt driving, a bending load repeatedly applied to the connecting members 16 and 17 can also be greatly mitigated, and [the] breakage or the like of the connecting members due to [the] metal fatigue of the conductor portions thereof can be prevented, and the durability of the apparatus is markedly improved.--

Please substitute the paragraph starting at page 17, line 3 and ending at line 11, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--The slip mechanism is effective to prevent a worm portion to be described, which is the drive transmitting mechanism of the worm wheel 22, from being damaged [injured] by the rotating force of the worm wheel 22 mounted on the tilt rotary shaft 11, [when] for example, when an unexpected extraneous force is applied to the camera unit 1 and a tilt rotating force works, thereby causing [the] aggravation of the accuracy of tilt rotation or bad tilt rotation.--

Please substitute the paragraph starting at page 17, line 12 and ending at line 27, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--Specifically, when an unexpected rotating force by an extraneous force works on the worm wheel 22, that surface of the worm wheel 22 which is adjacent to the frictional member 21 or that surface of the supporting metal plate 20 which is adjacent to the frictional member 21 tilt-rotates while rubbing against the frictional member 21 with the meshing position between the worm wheel 22 and the worm portion (not shown) [32b (Fig. 3 which will be described later)] maintained (with the worm wheel 22 and the worm portion [32b] being not rotated but remaining stopped). This frictional force is of such a value as will not cause slip by the setting of the amount of deformation of the wave-shaped washer 23 (Fig. 1), in the state of normal driving (driving by the electrical energization of a tilt motor 28 (Fig. 1[3])).--

Please substitute the paragraph starting at page 18, line 1 and ending at line 17, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--Fig. 3 shows the internal structure of the camera apparatus with a pan head according to the present embodiment as it is seen from a side thereof, and also shows a state in which the interior of the left supporting portion 12a-2 and the interiors of the movable portion 12a and fixed portion 12b of the pan head are exposed. The reference numeral 25 designates a tilt driving unit. A tilt motor 28 having a first gear 27 mounted thereon is fastened to a metal plate 26 by screws or the like, and a worm shaft 32 journaled by bearings (not shown) [29 and 30 (fitted to the metal plate 26)] and subjected to a biasing force for eliminating the backlash of the worm wheel side and in the thrust direction of the worm shaft by a leaf spring (not shown) [31 (fastened to the metal plate 26)] is disposed, and the first gear 27 and a second gear portion (not shown) [32a] of the worm shaft 32 are connected together by a timing belt 33.--

Please substitute the paragraph starting at page 18, line 18, and ending at line 25, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--Also, the worm portion (not shown) [32b] of the worm shaft 32 is threadably engaged with the worm wheel 22. The above described tilt driving unit is fastened to the interior of the camera supporting portion 12a-2 (Fig. 1) by screws or the like, and design is made such that when the tilt motor 28 is electrically energized, the driving force thereof is transmitted and the camera--

Please substitute the paragraph starting at page 18, line 26 and ending at page 19, line 5, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--The left supporting portion 12a-2 includes [reference numeral 34 denotes] a relay board (not shown) on which there are provided [the] a connector (not shown) [34a] of a connecting member 35 from the main circuit board 18 (Fig. 1), [the] a connector (not shown) [34b] of a connecting member (not shown) [36] from the terminal of the tilt motor 28, and [the] a connector (not shown) [38] of a connecting member (not shown) [37] from a position detector such as a photo-interrupter.--

Please substitute the paragraph starting at page 19, line 6 and ending at line 12, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--This relay board [34] succeeds to the tilt motor 28 and the position detector [39] and the main circuit board 18 (Fig. 1) and relays signal transmission. The connecting member 35 is bent in the camera supporting portion 12a-2 (Fig. 1) and is directed to the central portion of the apparatus. The relay board 34 may be provided in the right supporting portion 12a-1.--

Please substitute the paragraph starting at page 20, line 3 and ending at line 12, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--A cap member 43 is designed such that when it is fitted in a direction to deform the wave-shaped washer by an abutting surface 43b while being fitted to an outer peripheral portion 43a somewhat smaller than the inner diameter of a worm wheel 44, snap fit pawl portions 43c, 43d [-43e (43e being not shown)] come into engagement with a groove portion 41a-1 provided in the shaft portion 41a and the cap member 43 is locked to the shaft portion 41a and a slipping force similar to that on the tilt side works.--

Please substitute the paragraph starting at page 20, line 21 and ending at line 26, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--The connecting members 16, 17 (Fig. 2) and 35 (Fig. [3] 1) led about from the camera supporting portions 12a-1 and 12a-2 in Fig. 1 to the vicinity of the shaft portion 41a are guided to a pan case 48 which will be described later by a groove portion 41a-2 provided in the shaft portion 41a.--

Please substitute the paragraph starting at page 24, line 19 and ending at line 24, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--Also, the bending load repeatedly applied to the connecting members 16, 17 and 35 during pan driving can be greatly mitigated, and [the] breakage or the like of the connecting members due to [the] metal fatigue of the conductor portions thereof can be prevented and the durability of the apparatus is markedly improved.--

Please substitute the paragraph starting at page 26, line 19 and ending at page 27, line 19, with the following replacement paragraph. A marked-up copy of this paragraph, showing the changes made thereto, is attached.

--The pan head fixing case 50, as shown in Figs. 4 and 5, is [are] provided with three protruding pieces 50a, 50b and 50c, on the upper surface portions of which are mounted sliding members 104a, 104b and 104c made of resin or the like high in lubricity. These are members for restraining the movable portion 12a of the pan head from inclining when it performs the tilt/pan operation (particularly when it performs acceleration and deceleration). If the movable portion 12a of the pan head inclines greatly, the photographing optical system will deviate from a predetermined position and therefore, a desired photographing track (by pan/tilt) will not be obtained and in some cases, intended photographing cannot be effected and therefore, the movable portion 12a of the pan head may preferably be designed so as not to incline to the utmost. Fig. 6 is a cross-sectional view of the surroundings of the sliding member 104c. A sliding surface 12a-4-a is provided on the circumference of the umbrella portion 12a-4 of the movable portion 12a of the pan head so as to contact with the sliding members 104a, 104b and 104c and slide when the movable portion 12a of the pan head inclines slightly, thereby restraining the inclination (the sliding member contacted differs depending on the direction in which the movable portion 12a inclines). With such a construction, the inclination of the movable portion 12a of the pan head can be minimized and therefore, an apparatus of higher performance can be provided.--

MARKED-UP AMENDED CLAIMS

1. (Amended) A movable camera apparatus comprising:

a camera unit; [and]

a pan head comprising a movable portion and a fixed portion[, said movable camera apparatus including:];

first and second support portions erected from said movable portion of said pan head for supporting said camera unit from [the] opposite sides thereof for tilt rotation;

a first circuit board disposed in said camera unit;

a second circuit board disposed on said fixed portion of said pan head; and

a connecting member for connecting said first and second circuit boards together, said connecting member being a flexible flat cable, at least a part of which is disposed in an arcuate shape about a center line of tilt rotation of said camera unit, where;

wherein] the center of gravity of said camera unit is disposed near the center line of [said] tilt rotation[, and tilt rotation driving means is provided on said first support portion], and said connecting member is disposed on said second support portion; and

tilt rotation driving means provided on said first support portion.

4. (Amended) A movable camera apparatus according to Claim 1, wherein said [connecting member is a] flexible [member and] flat cable is formed into a voluted shape about the [vicinity of the] center line of [said] tilt rotation.

5. (Amended) A movable camera apparatus according to Claim 1, further comprising a case member.

wherein said support portions [are of structure having] provide an opening portion in the outer side thereof, and [a] said case member [for covering said opening portion] is mountable on said opening portion for covering said opening portion.

6. (Amended) A movable camera apparatus comprising:

a camera unit; [and]

a pan head comprising a movable portion and a fixed portion[, said movable camera apparatus including:];

first and second support portions erected from said movable portion of said pan head for supporting said camera unit from [the] opposite sides thereof for tilt rotation;

a first circuit board disposed in said camera unit;

a second circuit board disposed on said fixed portion of said pan head; [and]

a connecting member for connecting said first and second circuit boards together, said connecting member being a flexible flat cable, at least a part of which is disposed in an arcuate shape about a center line of tilt rotation of said camera unit, where said connecting member is disposed on said second support portion;

a tilt rotary shaft; and

tilt rotation driving means provided on said first support portion.

wherein said camera unit and said movable portion are shaped so that even if said camera unit is rotated to a nearly vertical position about [a] said tilt rotary shaft, the surface of said camera unit may not interfere with the surface of said movable portion[, and tilt rotation driving means is provided on said first support portion, and said connecting member is disposed on said second support portion].

9. (Amended) A movable camera apparatus according to Claim 6, wherein said [connecting member is a] flexible [member and] flat cable is formed into a voluted shape about the [vicinity of the] center line of [said] tilt rotation.

10. (Amended) A movable camera apparatus according to Claim 6, further comprising a case member, wherein said support portions [are of structure having] provide an opening portion in the outer side thereof, and [a] said case member [for covering said opening portion] is mountable on said opening portion for covering said opening portion.

11. (Amended) A movable camera apparatus comprising:

a camera unit; [and]

a pan head comprising a movable portion and a fixed portion[, said movable camera apparatus including:];

first and second support portions erected from said movable portion for supporting said camera unit from [the] opposite sides thereof for tilt rotation about a rotary shaft;

a first circuit board disposed in said camera unit:

a second circuit board disposed on said fixed portion of said pan head; [and]

a connecting member for connecting said first and second circuit boards together, said connecting member being a flexible flat cable, at least a part of which is disposed in an arcuate shape substantially about the rotary shaft;

[wherein tilt rotation driving means is provided in said first support portion,] said connecting member [is] being disposed in said second support portion[,]; and

tilt rotation driving means provided in said first supporting portion [said connecting member is disposed in a voluted shape substantially about the rotary shaft of the tilt rotation].

14. (Amended) A movable camera apparatus according to Claim 11, wherein said [connecting member is a] part of said flexible [member, and] flat cable is disposed in [a voluted] an arcuate shape in a direction to create a rotating force by the elasticity thereof in a direction opposite to the direction of rotation of the camera unit [by] due to gravity.

15. (Amended) A movable camera apparatus according to Claim 11, further comprising a case member,

wherein said support portions [are of structure having] provide an opening portion in the outer side thereof, and [a] said case member [for covering said opening portion] is mountable on said opening portion for covering said opening portion.

16. (Amended) A movable camera according to claim 11, further comprising guide means [is] provided in said second support portion for guiding at least a part of said connecting member [disposed] in [a voluted] an arcuate shape.

17. (Amended) A movable camera apparatus comprising:
a camera unit; and
a pan head comprising a movable portion and a fixed portion, and capable of being pan-driven, wherein said movable portion and said fixed portion have engagement means engaged with each other for pan rotation, [and the engaged portions of said engagement means] said engagement means includes a plurality of engaged portions on the circumference about a center of pan rotation, and said plurality of engaged portions are formed of a resin material high in lubricity.

DC_MAIN 102063 v 1